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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CHANG, JON CARLTON	
ART UNIT	**PAPER NUMBER**
2623	

DATE MAILED: 10/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/965,880	LIN ET AL.	
	Examiner	Art Unit	
	Jon Chang	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *19-22* is/are allowed.

6)☒ Claim(s) *1,2,4-7,9-12 and 24* is/are rejected.

7)☒ Claim(s) *3,8,13-18 and 23* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 September 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/28/01*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Specification

1. The disclosure is objected to because of the following informalities:

in paragraph [0052], first line, the word "on" should be inserted between "based" and "a".

Appropriate correction is required.

Claim Objections

2. Claim 23 is objected to because of the following informalities:

It appears that claim 23 should depend from claim 19, rather than claim 18.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 7 and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Application Publication 2002/0067857 to Hartmann et al. (hereinafter "Hartmann").

As to claim 1, Hartmann discloses a method for classification of areas of an input image in picture, graphics, or fuzzy classes, comprising the following steps:

a) extracting a plurality of features from an input image (paragraph [0025]); and

b) processing two or more extracted features using a soft classifier to classify areas of the input image in either picture, graphics, or fuzzy classes (classifier is a neural network, paragraph [0027], which is a soft classifier; paragraphs [0030] and [0032] discuss the classifying). (Note: the language of the claim refers to the picture, graphics and fuzzy classes in the alternative. Only one of the classes is needed to meet the claim. Hartmann discloses at least two of the classes.)

Regarding claim 7, Hartmann discloses the method as set forth in claim 1, wherein the plurality of features extracted in step a) include one or more edge features (paragraphs [0046]-[0048]).

As to claim 24, Hartmann discloses a method for evaluating the confidence level of the classification of an image, comprising the following steps:

a) extracting a plurality of features from an input image (paragraph [0025]);

b) classifying the input image in picture or graphics classes using at least one of the extracted features (paragraphs [0030] and [0032]); and

c) determining the confidence level of the classification using a combination of two or more of the extracted features (paragraph [0120]; the likelihood an image belongs to one of the classes is a confidence level).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior at under 35 U.S.C. 103(a).

7. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hartmann.

Regarding claims 9-12, Hartmann does not disclose any details of the neural network. The examiner takes Official Notice that the various details of the neural network (namely: feedforward architecture, input layer, hidden layer, output layer, backpropagation algorithm, nodes corresponding to features, at least one neuron in the hidden layer and neurons in the output layer) are well known. It would have been obvious to one of ordinary skill in the art to provide a conventional neural network as

Hartmann's neural network, which would provide the above features, because the technology is mature and the classification results would be reliable.

8. Claims 1-2, 4-7, 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of the article, "Distinguishing Photographs and Graphics on the World Wide Web" by Athitsos et al. (hereinafter "Athitsos") and the article, "Hybrid Neural Network System for Texture Analysis" by Arrowsmith et al. (hereinafter "Arrowsmith").

As to claim 1, Athitsos discloses a method for classification of areas of an input image in picture, graphics, or fuzzy classes, comprising the following steps:

a) extracting a plurality of features from an input image (section 4, the image metrics); and

b) processing two or more extracted features to classify areas of the input image in either picture, graphics, or fuzzy classes (section 5.1).

(Note: the language of the claim refers to the picture, graphics and fuzzy classes in the alternative. Only one of the classes is needed to meet the claim. Athitsos discloses at least two of the classes.)

Athitsos does not disclose using a soft classifier to process the extracted features. However, soft classifiers are well known in the art. For example, Arrowsmith teaches a neural network, which is a soft classifier. Arrowsmith's system reduces computational cost (second paragraph of Introduction). Therefore, it would have been

obvious to one of ordinary skill in the art to utilize Arrowsmith's neural network in Athitsos' method.

As to claim 2, Athitsos does not disclose that the plurality of features extracted in step a) include one or more spatial gray-level dependence texture features. However, this is well known as evidenced by Arrowsmith (see Introduction). It would have been obvious to utilize spatial gray-level dependence texture features because this would provide an additional feature for classification, thereby improving results.

Regarding claim 4, Athitsos further discloses that the plurality of features extracted in step a) include one or more color discreteness features (section 4, e.g., the color histogram metric would be indicative of color discreteness).

Regarding claim 5, Athitsos further discloses the method as set forth in claim 4, wherein the color discreteness features are based on features extracted from color histograms computed from a representation of the input image in a color space and wherein said features include one or more of a set of multiple normalized histograms (section 4, regarding the color historgram).

Regarding claim 6, Athitsos does not disclose that the color discreteness features are based on features extracted from color histograms computed from a representation of the input image in CIELUV color space and wherein said features include one or more of a set comprising a normalized histogram for the luminance color channel (R_L), a normalized histogram for the U color channel (R_U), and a normalized histogram for the V color channel (R_V). However, this is seen as obvious over Athitsos' use of the RGB color space, as it is well known to obtain the CIELUV color

space from the RGB color space (Official Notice). It would have been obvious to one of ordinary skill in the art to utilize a particular space depending on the needs of a given application, or the nature of the images.

As to claim 7, Athitsos discloses the method as set forth in claim 1, wherein the plurality of features extracted in step a) include one or more edge features (section 4, edge features would be indicated by the farthest neighbor metric).

Regarding claim 9, Arrowsmith teaches that the soft classifier of step b) is a neural network constructed in a feedforward architecture comprising an input layer, at least one hidden layer, and an output layer and includes a back-propagation algorithm (see System Architecture and Training section, including Fig.1).

With regard to claim 10, Arrowsmith further teaches that the input layer of the neural network is comprised of two or more source nodes corresponding to the two or more extracted features (see Fig.1).

Regarding claim 11, Arrowsmith teaches that the hidden layer of the neural network is comprised of at least one neuron (see Fig.1).

Regarding claim 12, the combination of Athitsos and Arrowsmith discloses that the output layer of the neural network is comprised of a first neuron and a second neuron for indicating the result of processing by the neural network and the corresponding classification of the input image between picture, graphics, or fuzzy classes (see Arrowsmith's Fig.1, which would output the classification when combined with Athitsos).

Double Patenting

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claim 1 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 09/965922. Although the conflicting claims are not identical, they are not patentably distinct from each other because they cover the same subject matter, the difference between the claims being that instant claim 1 requires use of a soft classifier. The Examiner takes Official Notice that soft classifiers are well known in the art. It would have been obvious to one of ordinary skill in the art to utilize a soft classifier in order to improve classification results.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

11. Claims 1, 2 and 4 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 5 of copending

Application No. 10/040693. Although the conflicting claims are not identical, they are not patentably distinct from each other because they cover the same subject matter, the difference between the claims being that instant claim 1 requires use of a soft classifier. The Examiner takes Official Notice that soft classifiers are well known in the art. It would have been obvious to one of ordinary skill in the art to utilize a soft classifier in order to improve classification results.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Allowable Subject Matter

12. Claims 19-22 are allowed.

13. Claims 3, 8, 13-18 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 19 requires a blender. As claimed, this limitation is not taught or suggested by the prior art. Similarly, claims 17 and 18 require details regarding blending, which, as claimed, are not taught or suggested by the prior art. Claim 13 requires details regarding the neural network which are not taught or suggested by the prior art. Claim 8 requires details regarding the edge features, which are not taught or suggested by the prior art.

References Cited

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 5,640,492 to Cortes et al. discloses a soft margin classifier.

U.S. Patent 5,917,963 to Miyake et al. discloses an image processing apparatus which utilizes a distribution of pixels to classify an image as natural or artificial.

U.S. Patent Application Publication 2001/0052971 to Tsuchiya et al. discloses an image processing method and apparatus which uses color saturation and color noise to determine whether an image is a computer graphic or a natural image.

U.S. Patent 6,351,558 to Kuwata discloses an image processing system and method which discriminates a natural picture based on number of colors.

Japanese Patent 11-55540 teaches classifying an image as artificial or natural based on a number of pixels in given colors.

Japanese Patent 11-66301 teaches classifying an image as artificial or natural using the ratio of pixels in given colors.

The article, "A comparative Study of Matrix Measures for Maximum Likelihood Texture Classification" by Berry et al. teaches use of the SGLDM for classifying synthetic and natural textures.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jon Chang whose telephone number is (703)305-8439. The examiner can normally be reached on M-F 8:00 a.m.-6:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703)308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jon Chang
Primary Examiner
Art Unit 2623

Jon Chang
September 7, 2004